IPnexus® AMP5071
1U MicroTCA™ System

Highlights

>> 1U Carrier Supports up to 6 AdvancedMC™ Modules

>> Designed for Deployment in Telecom, Aerospace and Defense, Medical, Enterprise, and Industrial Control

>> Application-Ready System When Configured with:
  - Performance Technologies' AdvancedMC™ Modules
  - NexusWare® Linux® OS
  - NexusWare® Portal, a Web-Based Management and Development Tool

>> Integrated Ethernet Switch with Dual 1 GbE to AMCs and Quad 1 GbE Uplinks

>> Integrated PCI Express® Switch Supports x4 PCIe Lanes

>> Integrated MicroTCA™ Carrier and Shelf Managers

>> Front-to-Back, Hot-Swappable Push/Pull Cooling with Serviceable Fan Trays

>> Redundant Hot-Swappable Power Supplies Support up to 40 W per Mid-Size, Single AMC Module

>> AC or DC Input Options

>> Telecom Clock Distribution

>> Full Compliance with PICMG® MicroTCA™ and AMC Standards

The AMP5071 is a highly reliable, high-performance, and highly integrated 1U MicroTCA™-compliant system that can support up to six mid-size, single AdvancedMC™ (AMC) modules. When configured with Performance Technologies' AMC modules and NexusWare® Linux® Operating System, this Application-Ready System meets the needs for cost-effective, and modular processing in a low-profile, appliance-style form factor for telecom, wireless, as well as aerospace and defense applications. It is usable out-of-the-box, eliminating the tedious steps involved in preparing and integrating hardware and software for application development.

High-Reliability, High-Performance, and Highly Integrated Architecture

Four-nines of availability is achieved with redundant and hot-swappable power supplies and fan trays. The same fan tray FRU operates in either the front or the back to minimize sparing costs.

For applications that require high-performance connectivity, the AMP5071 features dual 1 GbE Ethernet and x4 PCI Express® lanes to each slot. Storage is accommodated by direct SATA/SAS slot-to-slot connections between the AMC sites. The onboard platform management subsystem provides MicroTCA compliant carrier and shelf management.

The innovative AMP5071 system architecture maximizes payload slot density in a 1U form factor, while minimizing overhead costs. Non-payload functions, such as the Ethernet switch, PCI Express switch, and carrier/shelf manager are integrated into the rear of the chassis, thus eliminating the overhead costs associated with standard MCH modules.

Configuration and Details

The flexible slot bay supports all major AdvancedMC form factors, whether mid-size or full-size, single or double modules. Numerous configurations can be achieved with a mix of different AMC form factors. For example, the AMP5071 can support up to six mid-size, single AdvancedMC modules, or one full-size, double and two mid-size, single modules.

The AMP5071 features front-to-back/push-pull cooling, which is critical for NEBS installations, utilizing hot-swappable fan trays to cool up to 40 W per mid-size, single slot. AC input or DC input options are available with dual hot-swappable and redundant 300 W power supplies.

The front I/O panel features LEDs (in-service, out-of-service, and user-defined), a reset switch, and a platform management console port.

The back panel has quad 10/100/1000 Mb Ethernet uplink ports, a 10/100 Mb Ethernet out-of band platform management port, power input, and a power switch.

Performance Technologies offers cost-effective and high-performance AdvancedMC modules such as the x86 processor modules (AMC111, AMC121, AMC122), PowerPC® processor module (AMC131), storage/video module (AMC590), synchronous 4 port WAN communications module (AMC335), and Quad T1/E1/J1 communication controllers modules (AMC304/305).

Flexible Slot Configurations (6 mid-size, single payload slots)

The AMP5071 features six AdvancedMC payload sites. These sites can accept numerous AMC form factors:

- Mid-size, Single AMC modules [Mid-Single]
- Full-size, Single, AMC modules [Full-Single]
- Mid-size, Double AMC modules [Mid-Double]
- Full-size, Double AMC modules [Full-Double]

Each tier 2 AMC site can support a full-size, single AMC module. Similarly, double modules may be installed by removing struts from the carrier.

	Slot 1	Slot 2	Slot 3
Tier 2	AMC SITE 4 T2-S1	AMC SITE 5 T2-S2	AMC SITE 6 T2-S3
Tier 1	AMC SITE 1 T1-S1	AMC SITE 2 T1-S2	AMC SITE 3 T1-S3

Example Configurations


Front-to-Back Cooling Subsystem

The AMP5071 features front-to-back cooling. This is especially critical in NEBS specified installations. The front fan assembly (4 fans) pushes air through the AMCs, while the back fan assembly (4 fans) pulls the air through the chassis and exhausts out the rear. Some of the air intake is routed to the power supplies that have their own fans. A removable air intake grill located in the front of the chassis allows for routine replacement of a NEBS specified filter. Each slot receives an ample airflow of 1500 LFM to ensure cooling of up to 40 W per mid-size slot.
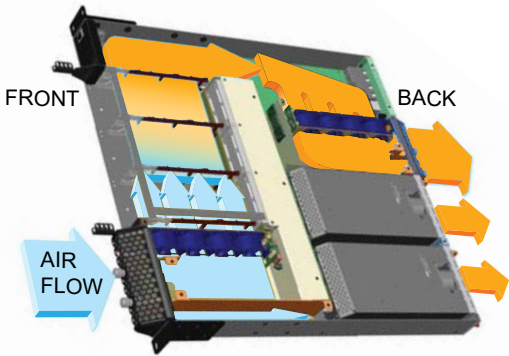
Power Subsystem

The system power is provided by dual, redundant and hot-swappable 300 W intelligent power supplies that are monitored by the platform management subsystem. The load-sharing supplies deliver up to 40 W of 12 V payload power and 3.3 V management power to each AMC site. AC and DC input options are available. An inhibit switch located in the back disables the power supply output.

Front Panel I/O
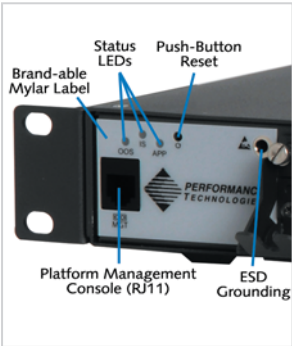
Back Panel I/O
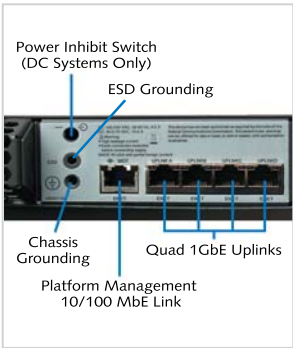
Ethernet Subsystem

The on-board Ethernet Switch provides dual 1 Gb SERDES Ethernet links to Port 0 and Port 1 of each AMC site. Four 10/100/1000Mb Ethernet uplink ports are available on the rear panel (RJ45). Via the Command Line Interface, Ethernet Switch functions can be configured, including:

- Port-Based VLANs
- 802.1Q VLANs
- Port Trunks (Up to four in the uplink ports and/or the port pairs to the AMC sites)
- Port Speed, Duplex, Pause Configuration on the uplinks
- Packet Thresholds (Broadcast Storm Suppression)
- Quality of Service
- Jumbo Frame Support
- BPDU Packet Forwarding Control
- Configuration Storage and Recovery

PCI Express® Subsystem

The Fat Pipes Ports 4-7 support x1, x2, or x4 lanes of PCI Express® (PCIe) to each AMC site. The root complex is located in the T2-S3 location. The PCIe subsystem in the AMP5071 supports hot plug capabilities (Presence Detect and in-band link state change notification). The AMP5071 provides PCIe clock distribution to each AMC site, sourced from either the root complex AMC or from the AMP5071.

SAS/SATA Storage Subsystem

The AMP5071 supports up to four storage AMC modules such as the AMC590 Video/Storage AdvancedMC™ Module. SATA/SAS channels are directly connected between the AMC sites from ports 2 and 3 on the right-hand slot to port 2 on slots 1 and 2 of their respective tier.
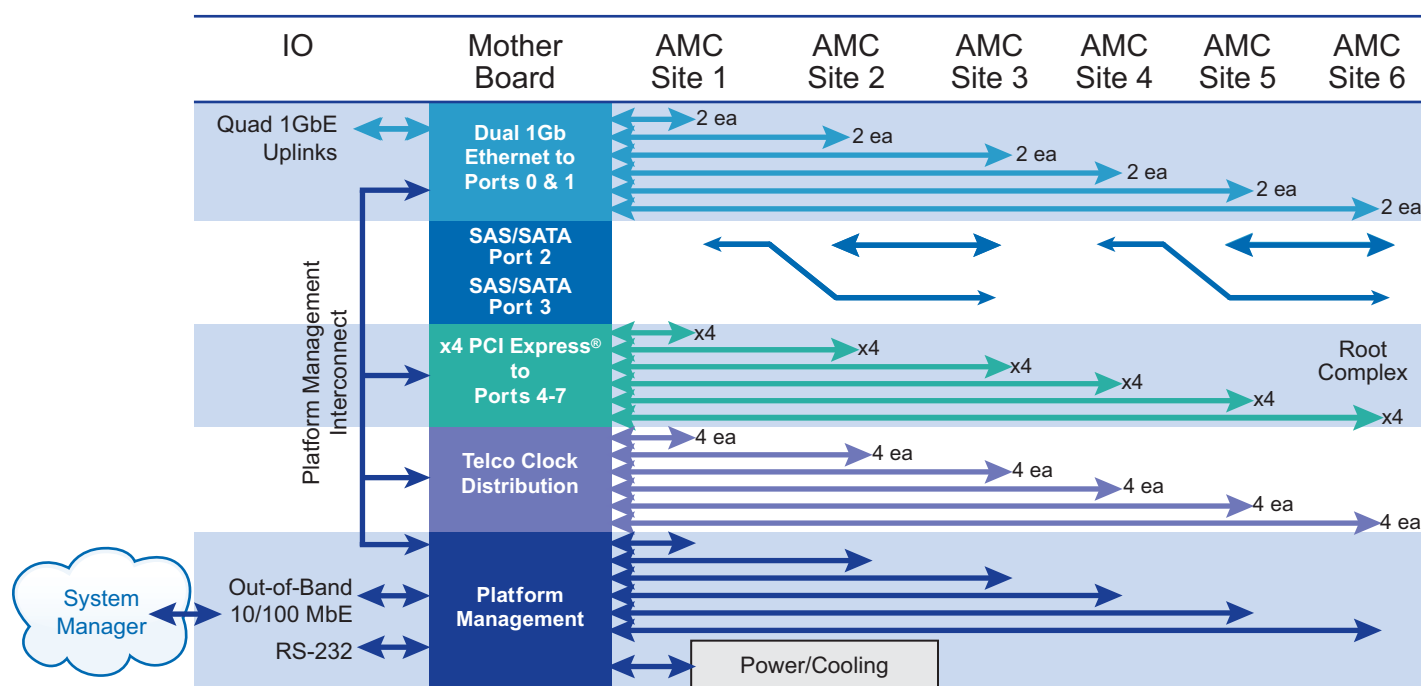
Comprehensive Platform Management Subsystem

The on-board platform management subsystem provides the complete shelf manager and carrier manager functions as specified in the MicroTCA.0 specification. The carrier manager monitors, manages, and controls the AMC payload boards and the active platform functions: Ethernet, PCI Express, Telco clock, and power and cooling subsystems. The shelf manager communicates with the carrier manager and interfaces to external management systems via an out-of-band 10/100 Mb Ethernet port located in the rear of the chassis.

Five management interfaces are available:

A. User-based Interfaces:

- NexusWare® Portal – a web-based GUI development and management tool that provides remote management and monitoring (LAN Interface)
- IO Front Panel – offers visual information via LEDs (Physical Interface)
- Command Line Interface (CLI) (Serial Interface from the Front Panel for Local Servicing)

B. Programmatic-based Interfaces:

- Remote Management Control Protocol (RMCP) (LAN Interface)
- Simple Network Management Protocol (SNMP) (LAN Interface)

IPnexus® AMP5071
Technical Specifications

Ordering Information

>> **PT-AMP5071-12363**
1U MicroTCA, 6 AMC sites, AC input, x4 PCIe, Dual 1 GbE/site

>> **PT-AMP5071-12364**
1U MicroTCA, 6 AMC sites, DC input, x4 PCIe, Dual 1 GbE/site

Accessories and FRUs

>> **PT-MTC5140-12300**
4HP, Single, Filler Panel
(All MicroTCA Systems)

>> **PT-MTC5131-12301**
4HP, Single, Air Management Blade
(All MicroTCA Systems)

>> **PT-MTC5132-12302**
2HP, Single, Air Management Blade(All MicroTCA Systems)

>> **PT-MTC5133-12358**
4HP, Single, Adjustable Airflow Blade
(All MicroTCA Systems)

>> **PT-MTC5134- 12375**
Power Supply Filler Panel for AMP5071 Systems

>> **PT-MTC5151-12371**
Air Filter for AMP5071 Systems, 10-pack

>> **PT-MTC5161-12372**
Fan Tray for AMP5071 Systems
(Front or Back)

>> **PT-MTC5122-12373**
19" Rack Mount Brackets for AMP5071 systems

>> **PT-MTC5123-12374**
23" Rack Mount Brackets for AMP5071 Systems

>> **PT-MTC6201-12307**
300 W, AC Removable Power Supply

>> **PT-MTC6211-12308**
300 W, DC Removable Power Supply

RoHS • WEEE COMPLIANT

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PICMG® Specifications
• Full Compliance with MicroTCA.0, AMC.0, AMC.1, AMC.2, AMC.3

AdvancedMC Interconnects and Specifications
• AMC.1 (ports 4-7): x1, x2, or x4 PCI Express®
• AMC.2 (ports 0-1): Dual 1 Gb Ethernet
• AMC.3 (port 2): 1 SATA/SAS port (see diagram)
• AMC.0: IPMB-L management interface

Front Panel Interfaces
• LEDs
  - In-Service
  - Out-of-Service
  - User Defined
• Serial Console Port
• Reset Switch
• Brand Label is Customizable

Back Panel Interfaces
• Quad 1 Gb Ethernet Uplink Ports
• 10/100 Mb Out-of-Band Shelf Manager Port
• Power Inhibit Switch
• Chassis Grounding

Power
• AC input: 100 to 240 V AC, 50 to 60 Hz, 4 to 2 A
• DC input: -40.5 to -60 V DC, 10 to 5 A

Mechanical
• Height: 1U, 44 mm (1.75 in.)
• Width: 442 mm (17.4 in.) without rack-mount flanges. Rack-mount flanges allow mounting to 19 in. racks
• Depth: 470 mm (18.5 in.)
• Weight: TBD kg (TBD lb)

Environmental
• The AMP5071 system (enclosure, fan trays, and Motherboard) is designed for harsh environments. The system features sturdy steel construction with a durable powder coat finish.
• Operating: 5 to 40°C z(41 to 104°F), up to 55°C (131°F) for 96 hours for both AC and DC power supplies
• Storage: -40 to 70°C (-40 to 158°F)
• Relative humidity: 5 to 85%, up to 90% for 96 hours, non-condensing

NOTE: To provide proper cooling of the AMP5071, each unused AMC slot in the chassis must be populated with the proper filler panel or Air Management Blade. Refer to "MicroTCA Air Management" White Paper.

MTBF
201,585 hours per Bellcore SR-332 Issue 1
99.994% Availability (Four-nines)

Agency Certifications (Pending)
Designed for NEBS Level 3 and ETSI installations

Safety
• UL/cUL 60950 Safety for Information Technology Equipment E179737
• EN/IEC 60950 Safety for Information Technology Equipment
• CB Certificate and Report Scheme
• CE Certificate

Regulatory Standards
• FCC, Class A
• EN 55022/CISPR 22 Class A Radiated and Conducted Emissions Tests
• EN 55024/CISPR 24
• EN-61000-3-2 Power Line Harmonic Emissions
• EN-61000-3-3 Power Line Fluctuation and Flicker
• EN-61000-4-2 Electro-Static Discharge (ESD)
• EN-61000-4-3 Radiated Susceptibility
• EN-61000-4-4 Electrical Fast Transient Burst
• EN-61000-4-5 Power Line Surge
• EN-61000-4-6 Frequency Magnetic Fields
• EN-61000-4-11 Voltage Dips, Variation, and Short Interruptions

Network Equipment-Building System (NEBS) Requirements
• GR-1089-CORE Issue 4
  – Sect. 2 Electrical Discharge
  – Sect. 3.2.2 Radiated RF Emissions
  – Sect. 3.2.3 AC Line Conducted
• Emissions-Voltage
  – Sect. 3.2.4 AC and DC Line Conducted
• Emissions-Current
  – Sect. 3.3.1 RF Radiated Fields
  – Sect. 3.3.3 RF Common Mode
• GR-63-CORE Issue 3
• Sect. 5.1.1.1 Low-Temperature Exposure and Thermal Shock
• Sect. 5.1.1.2 High-Temperature Exposure and Thermal Shock
• Sect. 5.1.1.3 High Relative Humidity Exposure
• Sect. 5.3.1 Handling Drop Tests-Packaged Equipment
• Sect. 5.3.2 Unpackaged Equipment Drop Tests
• Sect. 5.4.1 Earthquake Tests
• Sect. 5.4.2 Office Vibration Test
• Sect. 5.4.3 Transportation Vibration-Packaged Equipment
• Sect. 5.6 Acoustic Noise Test